

CLAIMS

What is claimed is:

- 5           1.       An infrared imaging apparatus for capturing comparative thermal images of two separated viewing areas, comprising:
- a single infrared camera;
- 10               a visual display apparatus; and
- one or more infrared image reflectors for redirecting infrared images of at least two separated viewing areas to said camera for transmission to said visual display apparatus for side-by-side presentation of the two or more areas viewed to permit comparison of the thermal images
- 15               of the two or more areas.
2.       The apparatus of claim 1 wherein said visual display apparatus comprises a computer.
3.       The apparatus of claim 2 wherein said computer controls selected functions of said
- 20               camera.
4.       The apparatus of claim 2 wherein said computer performs thermal image processing.
5.       The apparatus of claim 2 wherein said computer performs image analysis.
- 25               6.       The apparatus of claim 1 wherein said one or more infrared image reflectors comprise at least one substantially flat surface.
7.       The apparatus of claim 1 wherein said one or more infrared image reflectors comprise
- 30               at least one substantially parabolic surface.
8.       The apparatus of claim 1 wherein said one or more infrared image reflectors comprise at least one substantially convex surface.
- 35               9.       The apparatus of claim 1 wherein said one or more infrared image reflectors are adjustable.

10. The apparatus of claim 1 wherein said one or more infrared image reflectors have a vertical field of view of at least 45 degrees above horizontal.

5 11. The apparatus of claim 1 wherein said one or more infrared image reflectors have a horizontal field of view of at least 90 degrees centered on an axis orthogonal to the camera axis in the horizontal plane.

10 12. The apparatus of claim 1 wherein said one or more infrared image reflectors comprise a material selected from a list consisting essentially of aluminum, stainless steel, polished mild steel, copper, a first surface mirror, or any combination thereof.

13. An apparatus for comparative viewing of an undercarriage of a vehicle to detect defects or anomalies in components thereof comprising:

15 an infrared camera mounted in an enclosure positioned beneath a vehicle undercarriage for capturing thermal images of selected portions of said undercarriage within the field of view of said camera;

20 one or more infrared image reflectors mounted in said camera field-of-view so disposed as to permit said camera to capture two spaced apart thermal images for transmission to said viewing apparatus; and

25 a viewing apparatus disposed remotely from said enclosure for visually displaying side-by-side thermal infrared images to permit comparison of said images of undercarriage components within the field-of-view of said camera.

14. The apparatus of claim 14 wherein said viewing apparatus comprises a computer.

30 15. The apparatus of claim 15 wherein said computer controls selected functions of said camera.

16. The apparatus of claim 15 wherein said computer performs thermal image processing.

17. The apparatus of Claim 14 wherein said camera and said infrared image reflectors are disposed in such a manner as to allow said camera to observe a left and right side of the vehicle's front or rear tire and brake assembly in a side-by-side manner.

5 18. The apparatus of claim 14 wherein said one or more infrared image reflectors comprise a material selected from a list consisting essentially of aluminum, stainless steel, polished mild steel, copper, a first surface mirror, or any combination thereof.

10 19. The apparatus of claim 14 wherein said one or more infrared image reflectors are adjustable.

20. A method for detecting defects or anomalies in the running gear of a vehicle comprising the steps of:

15 positioning an infrared camera at a location so that a vehicle can pass over the camera;

positioning one or more infrared image reflectors within the field-of-view of the camera so as to enable the camera to capture the thermal image of two spaced apart vehicular components;

20 adjusting the field-of-view of the one or more infrared image reflectors and camera so as to encompass left and right side running gear;

transmitting the thermal images to a viewing apparatus; and

25 simultaneously displaying the thermal images from each side running gear so as to permit comparison of the heat characteristics thereof.

21. The method of claim 22 wherein the step of adjusting the field-of-view comprises adjusting the field-of-view of the one or more infrared image reflectors and camera so as to encompass  
30 left and right side brake components.

22. The method of claim 22 further comprising the step of providing a computer.

23. The method of claim 23 further comprising the step of performing thermal image  
35 processing with the computer.

24. The method of claim 25 further comprising the step of performing visual image analysis with the computer.

25. The method of claim 25 further comprising the step of controlling selected functions of  
5 the camera with the computer.